U.S. Fire Administration/Technical Report Series

Power Off to Hard-Wired Detector in Nine-Fatality House Fire

Peoria, Illinois

USFA-TR-031/April 1989



U.S. Fire Administration Fire Investigations Program

The fires usually involve multiple deaths or a large loss of property. But the primary criterion for deciding to do a report is whether it will result in significant "lessons learned." In some cases these lessons bring to light new knowledge about fire--the effect of building construction or contents, human behavior in fire, etc. In other cases, the lessons are not new but are serious enough to highlight once again, with yet another fire tragedy report. In some cases, special reports are developed to discuss events, drills, or new technologies which are of interest to the fire service.

The reports are sent to fire magazines and are distributed at National and Regional fire meetings. The International Association of Fire Chiefs assists the USFA in disseminating the findings throughout the fire service. On a continuing basis the reports are available on request from the USFA; announcements of their availability are published widely in fire journals and newsletters.

This body of work provides detailed information on the nature of the fire problem for policymakers who must decide on allocations of resources between fire and other pressing problems, and within the fire service to improve codes and code enforcement, training, public fire education, building technology, and other related areas.

The Fire Administration, which has no regulatory authority, sends an experienced fire investigator into a community after a major incident only after having conferred with the local fire authorities to insure that the assistance and presence of the USFA would be supportive and would in no way interfere with any review of the incident they are themselves conducting. The intent is not to arrive during the event or even immediately after, but rather after the dust settles, so that a complete and objective review of all the important aspects of the incident can be made. Local authorities review the USFA's report while it is in draft. The USFA investigator or team is available to local authorities should they wish to request technical assistance for their own investigation.

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Power Off to Hard-Wired Detector in Nine-Fatality House Fire Peoria, Illinois

Investigated by: Daniel J. Carpenter, Jr. Charles Jennings

This is Report 031 of the Major Fires Investigation Project conducted by TriData Corporation under contract EMW-88-C-2649 to the United States Fire Administration, Federal Emergency Management Agency.

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Department of Homeland Security
United States Fire Administration
National Fire Data Center

U.S. Fire Administration Mission Statement

As an entity of the Department of Homeland Security, the mission of the USFA is to reduce life and economic losses due to fire and related emergencies, through leadership, advocacy, coordination, and support. We serve the Nation independently, in coordination with other Federal agencies, and in partnership with fire protection and emergency service communities. With a commitment to excellence, we provide public education, training, technology, and data initiatives.



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Power Off to Hard-Wired Detector in Nine-Fatality House Fire Peoria, Illinois April 11, 1989

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OVERVIEW

A fire originating in the first floor of a two-story, wood-frame house with two rental units in Peoria, Illinois, killed two adults and seven children on April 11, 1989. Two other adults and a teenager were injured, though they were able to escape from the burning house onto a porch roof from a second story window. This was the worst life-loss fire in Peoria for at least the past three decades.

Although the house was equipped with hard-wired smoke detectors on each floor, the electricity on the circuit powering the first floor detector had been turned off inadvertently when the power company disconnected power to the first floor apartment for non-payment of bills. The detectors on both floors were wired on circuits individual to each apartment. The second floor detector was wired correctly and had power, but whether it operated during the fire was not determined.

The rest of the scenario is all too familiar: an apartment overcrowded with multiple families and a high ratio of young children to adults. They did not become aware of the fire until late in its development. All of the fatalities were attributed to high carbon monoxide levels. Autopsies revealed that drugs or alcohol did not contribute to the deaths.

SUMMARY OF KEY ISSUES

Issues	Comments		
Fire Cause	Arson by an acquaintance of the victims.		
Casualties	9 dead, including 7 children aged 2 months to 10 years old; 3 injured, including two adults, one youth.		
Smoke Detectors	Hard-wired smoke detectors were present on the first and second floors.		
	Power to the first floor apartment had been disconnected for delinquent payment. Power company not aware of potential impact on detectors.		
Overcrowding	Twelve people occupied the 600 square foot apartment originally rented to a mother and her three children.		
Covered Windows	Several windows had been covered with drywall before the fire, although each room had at least on other window.		
Open Door	A door left open at the foot of the stairs leading to the second floor probably contributed to rapid fire spread.		
Firefighter Stress	Post-incident traumatic stress among the firefighters was mitigated by prompt use of a debriefing team.		
Victim Behavior	Several young victims were found directly in front of window leading to porch roof.		

The cause of the fire was arson. It was started in a rollaway bed in the vacant first floor apartment by a visitor who had been asked to leave the second-floor apartment. He has been charged with nine counts of murder and two counts of aggravated arson.

BACKGROUND

The property involved was a two-story frame house with two rental units, one upstairs and the other downstairs. The dwelling had a history of city building code violations dating back to 1965, with violations again in 1978, 1979, and 1980. These violations were apparently corrected. No record was found of the building being inspected again for building violations in the nine years before the fire. Several windows and doors were boarded up at the time of the fire.

According to the owner of the two-story frame house, the second floor apartment was rented to Terry Davis and her three children, Arnisha, Carlyssa, and Tanoa Davis. Her sister's family (Hobbs) and her former downstairs neighbor's family (Barnes) also lived there. The owner said he was not aware that three families with twelve people were living in the 600 square foot apartment at the time of the fire. The city housing code requires 150 square feet of living space for the first occupant and 100 feet for each occupant thereafter. The space was clearly overloaded at the time of the fire. "This may have hampered the escape of some of the occupants," according to Peoria Fire Chief G. John Parker.

One of the three families on the second floor was headed by Joyce Barnes. Her family had been occupying the first floor apartment until just a few days before the fire, when she moved upstairs with the Davis and Hobbs families. The electric company had disconnected the power to her first floor apartment on April 4 (a week before the fire) as a result of delinquent bills, which stimulated her move.

Shortly before the tragic fire on Monday, April 10, four adults and eight children were asleep in the upstairs apartment. At approximately 2330, a male visitor, age 34, was asked to leave as the others were going to bed. He remained in the neighborhood and re-entered the vacant downstairs apartment through a window at approximately 0200 hours on Tuesday. In preliminary interviews by Bureau of Alcohol, Tobacco and Firearms (ATF) and police investigators, the man said he accidentally set a fire on a rollaway bed in the living room/hallway of the first floor apartment. In subsequent interviews he allegedly admitted to intentionally setting the fire.

Once again, the fire quickly spread to the second floor where the occupants were sleeping.

THE FIRE

At 0220, the fire was reported to the Peoria Fire Department by the people living in the house next door. One of these neighbors told firefighters that "the fire was just blazing all of a sudden." The neighbors observed "fire coming, from upstairs, and people jumping." Upon arrival four minutes later at 0224, District #1 Battalion Chief Roy Modglin observed a working fire involving both the first and second floors. He immediately called for a second alarm. Two of the occupants trapped on the front porch were quickly rescued, and they, plus one of the occupants who had jumped from the roof to the ground in the front yard, were treated and sent to local hospitals.

Recognizing the severity of the situation and the progress the fire had already made, Chief Modglin requested other units to "step it up." He also requested paramedics and additional ambulances, having learned that several small children were still trapped on the second floor.

Two engines, a rescue unit, a truck, and a battalion chief comprised the first alarm response. These units made an immediate attack to control the fire, and rescue operations were begun. One and three quarter inch hoselines were advanced to the interior of the first floor to protect the stairwell, with the second line (1-1/2-inch) taken to the north side (the back) of the building. See Appendix A for the floor plan. Ladders were raised on all sides of the building to expedite rescue attempts. Chief Modglin requested additional staffing with airpacs to the scene. He also requested that additional ambulances, senior officers, and the coroner's office be notified.

As firefighters from the rescue unit and engine companies gained entrance through the front door, fires were knocked down on the first floor and up the stairway to the second floor. Knowing the primary objective in this situation was to rescue the occupants still trapped in the building and not knowing if anyone were still alive, effort was made to bring the fire under control only to the extent that rescue could be accomplished. Each time the fire gained sufficient headway to make rescue attempts impossible, the firefighters were obliged to re-direct their efforts to knock down and control the fire. This procedure may have allowed the fire to burn parts of the building more extensively than if all fire suppression efforts were directed to extinguish the fire. However, under similar circumstances, such efforts have saved lives and seem well justified. Unfortunately, the victims in this fire were in all likelihood beyond help at this point anyway.

The fire was confined to the building of origin. The interior of the building was extensively burned. The rapid spread of the fire up the stairwell was evidenced by the extensive burning in this area as well as by the severe smoke and burn patterns around the north wall window at the head of the stairwell.

As the fire was brought under control, search and rescue attempts were conducted. These attempts were somewhat hindered by a lack of adequate breathing air supply for the first crews on the scene and also the rekindling of the fire throughout the building.

Ladder company personnel subsequently gained access to the roof and cut two holes to begin ventilation procedures. Additional ladders and hoselines were eventually placed on all sides of the building.

Seven victims were discovered in the front room on the south side of the building. One other victim was found in the hallway at the top of the stairs and one in the center bedroom at the north side. Some were pronounced dead at the scene, others at hospitals. Four of the children's bodies were found within four feet of the windows leading to the porch roof. Indications are that the children may have been brought to the front room by their parents, or gone there to be with their parents, and were overcome by smoke before they could get out or be helped out of the building.

As additional victims were discovered, additional staffing and ambulances were summoned until approximately 40 personnel arrived at the scene. Backup units were called in to provide cover for those companies at the scene.

While rescuing two of the occupants from the front porch, two firefighters received minor back strains and pulled arm ligaments.

CASUALTIES

At the time of the fire, all of the occupants of this two-story, wooden frame dwelling were living in the second floor apartment. All were killed or injured. The people killed by the fire were:

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Terry Davis, 27;
Arnisha Davis, 7;
Carlyssa Davis, 2;
Tanoa Davis, 10;
Wanda Hobbs, 20;
Felicia Hobbs, 3;
Ashley Hobbs, 1;
Jacolby Thomas, 2;
Eugene Young, 2 months.
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Those injured were:

Joyce Barnes, 30 (critical injured but survived; sent to the burn unit at St. Francis Medical Center in Rock Island, Illinois).

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Eric Davis, 14; son of Joyce Barnes and Carl Wells (sent to same burn unit);
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Carl Wells, 29 (treated and released).

FIRE CAUSE AND SPREAD

In the City of Peoria, Illinois, the fire marshal has the responsibility to determine the origin and cause of fires. In the event a fire is determined to be of an incendiary nature the police department assists in the investigation and continues with the case. The ATF also offered assistance in this incident.

Fire investigators confirmed that the fire was started on the rollaway bed. "V" patterns on the wall in this area attest to the fire having burned upward and outward in this spot. The fire was determined to have been intentionally set with burning newspapers used to ignite the bedding. There were no indications that a flammable liquid had been used. Accidental causes were eliminated, including a gas space heater also located on the first floor of the dwelling that was originally considered as a possible cause of the fire.

Based on burn patterns, a door at the foot of the stairs leading to the second floor was either open before the fire started or opened during the fire, possibly by the adult male victim who tried to escape down the stairs, then went back up the stairs and out the window to the porch roof. That open door contributed to the rapid spread of smoke and flames to the second floor.

Smoke also spread to the upstairs apartment through the chases going from the first floor to the second floor. Ultimately, the fire spread rapidly inside the walls and up the stairway to the second floor. Several other windows were boarded up, which hampered firefighters gaining entry to fight the fire.

ESCAPE ROUTES AND OCCUPANT ACTIONS

The question remains as to why seven of the victims were all found in the front room but did not escape. Four of the children (a 2-month old, two 2-year olds, and a seven-year old) were found at the windows, quite possibly put there or led there by the two adult women who died. These women were found near the interior entrance to a storage room through which access could be gained to the bedroom where one of the other children was found. Were the children responding to the directions of an adult member of the household in the hope of exiting through the front window onto the porch roof, as the other occupants who survived had done? Did they gather but then not escape because the adults succumbed? Did the upstairs smoke detector alert the occupants?

One of the survivors, Carl Wells, told firefighters he had tried to go downstairs but when he felt the door at the foot of the stairs (which he thought was closed at the time) he realized that this door was too hot. He then went back up the stairs and out through the front window onto the porch roof. He dropped from the roof to the ground, sustaining a slight injury.

Because the performance of the upstairs smoke detector is unknown, several scenarios emerge depending on the status of the detector and exact sequence of the occupants' investigation activity and escape activity. Regardless of whether the upstairs detector was or was not functioning, smoke from the fire downstairs had not yet reached a heavy level in the upstairs apartment when Wells went downstairs to investigate conditions on the first floor. Wells retreated up the stairs and, judging from his position on fire department arrival, escaped severe smoke and heat conditions by seeking refuge on the porch roof. The position of the other occupants would indicate that they were alert and initiating some action concurrent with the investigation activity. The investigation could have been initiated by the activation of the smoke detector, with occupants taking little action beyond awakening, or could also have been initiated by Carl Wells after he discovered the fire downstairs. Their delayed awareness of the fire and the sudden influx of fire products left insufficient time for escape.

The answers are not known, but the circumstance is common. The rapid accumulation of toxic gases coming up the stairway did not afford much time to escape – especially if the adults were confronted with too many children to handle, and if they had not practiced escape drills. The adults who perished also may have been faced with a difficult decision – whether to try to find the remaining two

children or to leave with some of the children who were not immediately in the path of the flames. Also, they, like most people, may not have realized the deadliness of the gases and how fast conditions can deteriorate.

As noted earlier, some of the windows and doors on the first and second floors were boarded up or blocked by heavy appliances. This probably did not impede escape in this particular situation because there appeared to be adequate egress through the remaining windows if one were willing to climb out or jump. Several of the windows were high enough from the ground to deter a child from jumping, and perhaps also an adult, if they were not trained or helped to do so. Even jumping onto the porch roof may not have been obvious or feasible for the children.

CODE COMPLIANCE

The house had a history of building code violations dating back to 1965, but the last one was in 1980. Since then there was no record of any inspections for building code violations, only environmental inspections.

Possible violations of the City Housing Code were investigated after the fire, especially with regard to the boarded up windows and doors. They were judged not be a violation because of an adequate number of remaining windows in each room. However, a permit usually must be issued before such boarding can be done. No such permit had been obtained by the owner or the occupants prior to the fire. Two windows were boarded on the second floor. On the first floor, a front door and a rear window were also boarded up. According to the owner, the upstairs windows were boarded before he purchased the building, while the downstairs windows were boarded up to "keep burglars out."

SMOKE DETECTORS

The City of Peoria has adopted the Building Officials and Code Administrators (BOCA) National Fire Prevention Code of 1987. They also passed an ordinance in 1975 requiring smoke detectors in all apartment buildings. The State of Illinois also passed a similar law in December 1987. Both city and State laws require all houses to have smoke alarms near sleeping areas. Both require detectors to be retrofitted in all apartment houses with three or more units. In 1983, Peoria also required hard-wired detectors in all new residential properties regardless of size, including one or two family homes. The owner of the fire building, which was equipped with hard-wired smoke detectors, was not required to install hard-wired detectors and actually exceeded the minimum requirements of the code in effect at the time of installation.

Installation and repair of smoke detectors in rental properties is the responsibility of the landlord. Failure to comply is a misdemeanor and is punishable by a fine and/or jail sentence. Routine maintenance, such as dusting or changing batteries is done by the tenant. Removal of batteries or tampering with a smoke detector is a violation punishable by a fine and/or a jail sentence.

The owner of the fire property stated that hard-wired smoke detectors had been installed on both the first and second floors and were connected to the main electrical system. Fire investigators confirmed that hard-wired smoke detectors (FIREX) were present at the time of the fire.

The electrical power to the empty first floor apartment had previously been shut off because of unpaid bills. This disabled the first floor detector, which was where the fire started. It is believed that if both smoke alarms had been operable, some or all lives may have been saved. The family upstairs might well have heard the downstairs alarm and had more time to escape.

IMPACT ON FIREFIGHTERS

A feeling of depression and frustration prevailed among firefighters as they continued to relive the events of this tragic fire. Even knowing that every possible effort to rescue the seven children and two adults who perished in the fire had been made, it was not enough to eliminate this traumatic event from their minds.

Recognizing the post-incident traumatic stress of the firefighters, a debriefing by experts from a Critical Incident Debriefing Team was requested by Chief John Parker to help them cope with the psychological aspects of the fire.

While almost 40 firefighters responded to the scene, those who were believed to have had the greatest exposure and were thought to be the most at risk for traumatic stress disorder were those who arrived first at the scene. "The frustration of trying to locate survivors, only to find victims, many of whom were children, must indeed take its toll of even the most experienced firefighter," said Chief Parker.

The debriefing team, which was comprised of nurses, fellow firefighters who had experienced similar situations, medics, and counselors, was assembled in Champaign, Illinois, and brought to Peoria. Sessions at the Central Fire Station were thought to be very beneficial according to firefighters interviewed.

One of the primary benefits of this program was the team's ability to assemble and respond shortly after being alerted. Their prompt arrival allowed Peoria firefighters to discuss this tragic experience with other professionals and thereby alleviate some of the feelings of anger, depression, frustration, and loss that is normally associated with this type of experience.

LESSONS LEARNED

1. Power companies need to be alerted to the possibility of disabling smoke detectors when they shut off power to a residence.

Most power companies are very aware of the potential for electrical fires, but they may not be equally aware of the potentially disastrous effect on early fire detection when they terminate electrical service to a residence.

Fire departments should attempt to work out an arrangement with the local power company to assure that the appropriate official is notified when the power gets turned off. This is especially important when city ordinances require hard-wired systems that might be disabled by a power turn-off when the building code requires electric service for safe occupancy of a dwelling.

2. Hard-wired smoke detector installation ordinances should specify that detectors are wired in such a way that turning off electricity to one apartment or unit does not disable smoke detectors through the building.

Although the detectors in this fire were properly installed, the possibility that both detectors were disabled was considered early in the investigator.

Each community should inspect or develop ways to assure that hard-wired detectors are properly installed so that a selective power disconnect will not disable all the smoke detectors in a building.

3. Overcrowded apartments can lead to a disaster when fire occurs.

The supply of adequate housing to prevent overcrowding cannot be addressed by fire departments. However, fire departments can warn people in low income areas of the terrible risk they run by overcrowding, especially when many small children are present. This fire and others similar to it in Milwaukee and Prince George's County, Maryland, to name just two, might be cited as examples.11

4. Low income renters are a target group in special need to escape drill training and motivation.

Exit drills are well known, but not widely practiced, especially in low income areas. Knowing and having practiced how to get through a window onto a roof might have enabled more of the occupants in this fire to escape once their usual exit route down the stairs and out the front door was blocked by fire. The need to be familiar with alternate escape routes should be stressed all the more in areas where there may be overcrowding, and in homes with young children. The nature of fire and smoke, the short time to react, and the need to exit via windows, if necessary, should all be addressed.

5. Windows must be kept free from barriers.

Several windows here were boarded up. That not only reduces the number of exits, but can add confusion in a smoky fire situation. The boarded windows in this particular fire may not have affected escape opportunities because there were two unboarded windows close to the front of the house overlooking the porch roof. Nevertheless, the boarding reduced escape options and was cited as interfering with suppression and rescue efforts.

6. Building code violations affecting escape are especially important to remedy.

Inspecting for code violations in rental one and two-family residences is usually a low priority in most communities. It often is the responsibility of the building department. Getting a speedy resolution of problems in low income areas with absentee landlords can also be difficult. Nevertheless, it is a life safety issue and should be addressed by local authorities. Most people who die in fires do so in one and two family homes.

7. Firefighter stress after multi-casualty fire needs immediate attention.

Peoria acted very promptly to get psychological assistance for the firefighters involved in this tragedy, which helped mitigate the impact on the department.

¹ "Four House Fires That Killed 28 Children, "U.S. Fire Administration, Federal Emergency Management Agency, 1988.

SUPPLEMENT

Fire Kills Five Children in Townhouse with Working Smoke Detector Annapolis, Maryland

On January 25, 1989, a fire originating on the first floor of an Annapolis, Maryland, townhouse-style apartment killed five children and injured four adults, three of whom exited via windows on the second floor. An operational smoke detector was in-place outside the second floor sleeping area. Though the smoke detector worked it failed to assure the life safety of the occupants. Conditions found in the house are not uncommon in households, generally.

THE FIRE

The fire originated in an upholstered chair in the living room and was caused by a carelessly discarded cigarette. One visitor was sleeping downstairs, the rest of the occupants were in second floor bedrooms. The fire apparently smoldered for some time before breaking into flames. The occupant of the first floor awakened shortly thereafter, and ultimately evacuated through the front door, leaving it open. He was reported to be intoxicated.

Because the temperature in the living room was not high enough to force smoke up the stairwell, the detector still had not activated. The open front door vented some of the smoke to the exterior and contributed oxygen to the fire.

When the fire developed sufficiently (1-3 minutes), smoke and heat traveled upstairs and activated the smoke detector. Two adults in one bedroom opened the door and were greeted with heavy heat and smoke. They evacuated via their bedroom window. The woman in the second bedroom attempted the same action, but when she opened her window, the door to the hallway, which did not have a latch keeper, was pushed open by the pressure of the fire. Almost instantly, the fire products extended into the bedroom and began to vent from the just-opened window. The woman apparently jumped from the window almost instinctively, leaving five children in the bedroom. Post mortem examination of the victims revealed that carbon monoxide levels in blood were well below lethal levels, suggesting that all five children burned to death.

This tragic fire is of interest not only because it documents a case in which the lack of smoke detectors on each level of a dwelling contributed to deaths, but because of its similarities to the Peoria fire.

The following sources were used in this supplement: Annapolis Fire Marshal's Investigation Report No. 890101713, press clippings from the Annapolis Capital and Baltimore Sun, and Anne Arundel County Sun and an analysis performed by Dr. James Quintiere, Dr. Robert Levine, and Harold Nelson of the Center for Fire Research/National Institutes of Standards and Technology (NIST).

Visiting Occupants – This apartment was normally occupied by two adults and a child. On the day of the fire, a second child was visiting, and a woman and her three children were staying with the regular residents until she could find a permanent apartment of her own. Also, a male visitor was sleeping downstairs when the fire started.

Intoxication – The male visitor was reportedly intoxicated. In Peoria, the fire was intentionally started by a house guest who had been turned away earlier in the evening for having been under the influence and rowdy.

No smoke detector in area of origin – Although a working smoke detector was installed outside the second floor sleeping area, analyses by the Annapolis Fire Department and NIST investigators invited in from Washington showed that smoke from the smoldering chair did not have sufficient energy to travel upstairs. Only after the fire progressed to the flaming stage did the smoke detector activate, after the stairway was already impassable.

Children die in fires – Children are at tremendous risk in fires. Even when adults are able to attempt to remove them as was the case in Peoria, children's inability to initiate self-help activity can lead to tragic results. This inability is amplified by the Annapolis fire, in which conditions deteriorated so quickly that conventional evacuation action (such as lowering children from the window) was impossible.

CONCLUSION

The underlying lesson in both these fires is that smoke detectors are needed on every level of residences. National Fire Protection Association 74 (1989) Household Fire Warning Equipment* requires installation of smoke detectors outside of each separate sleeping area and on "each additional story of the family living unit."

While many fire departments are promoting the importance of having detectors on every level of a house or apartment unit, others are not. Certainly, a significant number of residences in the United States do not have smoke detectors on each separate level. Many people doubtless believe that a single smoke detector outside the sleeping area is adequate to assure their safety. The need for additional smoke detectors should be strongly stressed in public fire safety education. It should also be reflected in future legislation requiring installation of detectors.

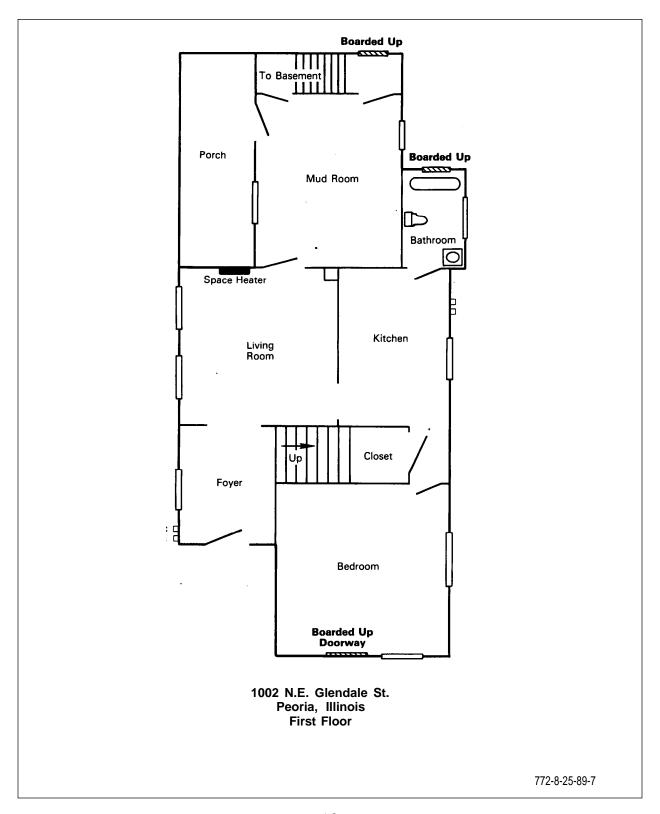
^{*}Please refer to the complete standard for determining smoke detector requirements.

APPENDICES

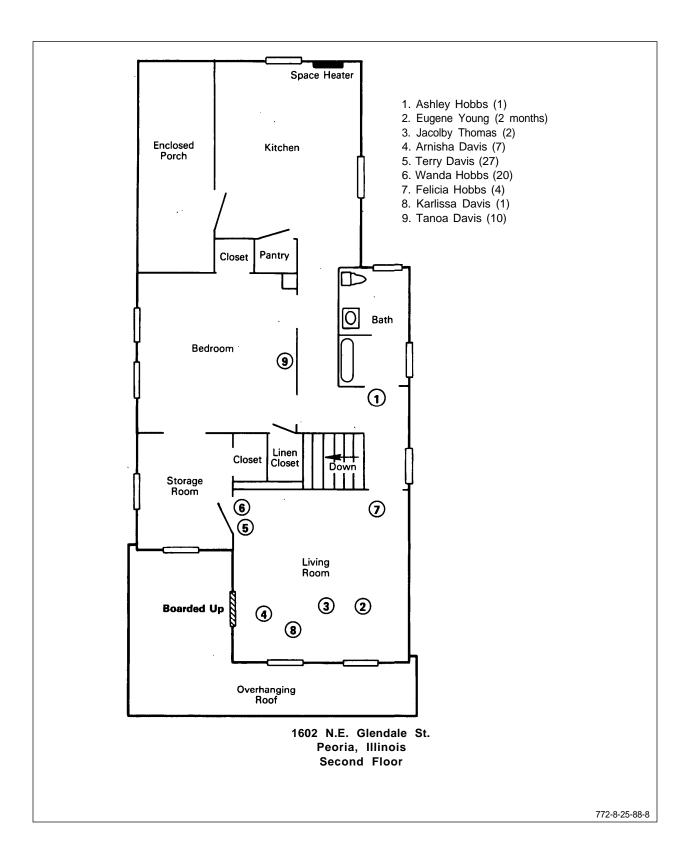
- A. Floor Plans
- B. Map of Downtown Peoria Showing Fire Location and Station Locations
- C. Photographs
- D. Fire Department Report Concerning Status of Smoke Detectors in Fire Building

APPENDIX A

Floor Plans

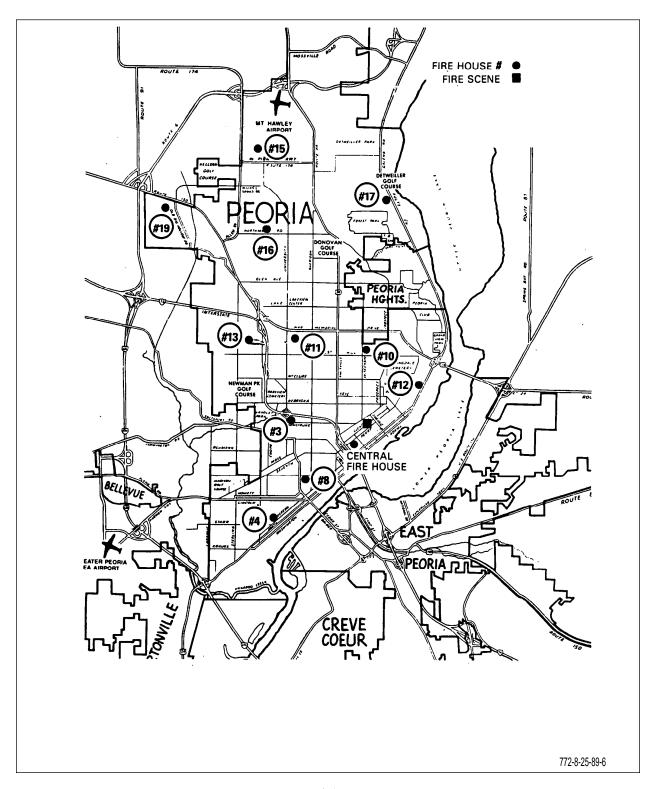


Appendix A (Continued)



APPENDIX B

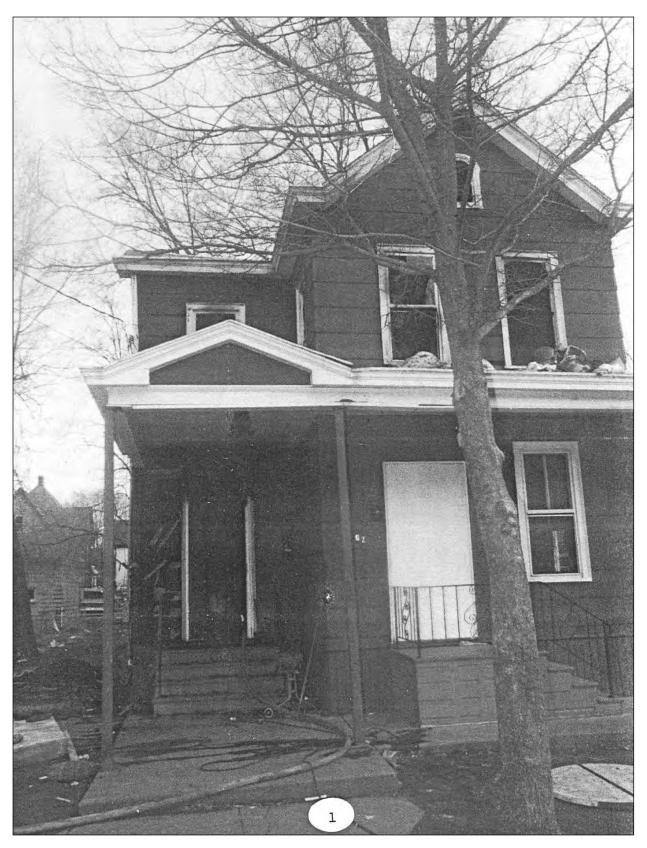
Map of Downtown Peoria Showing Fire Location and Station Locations



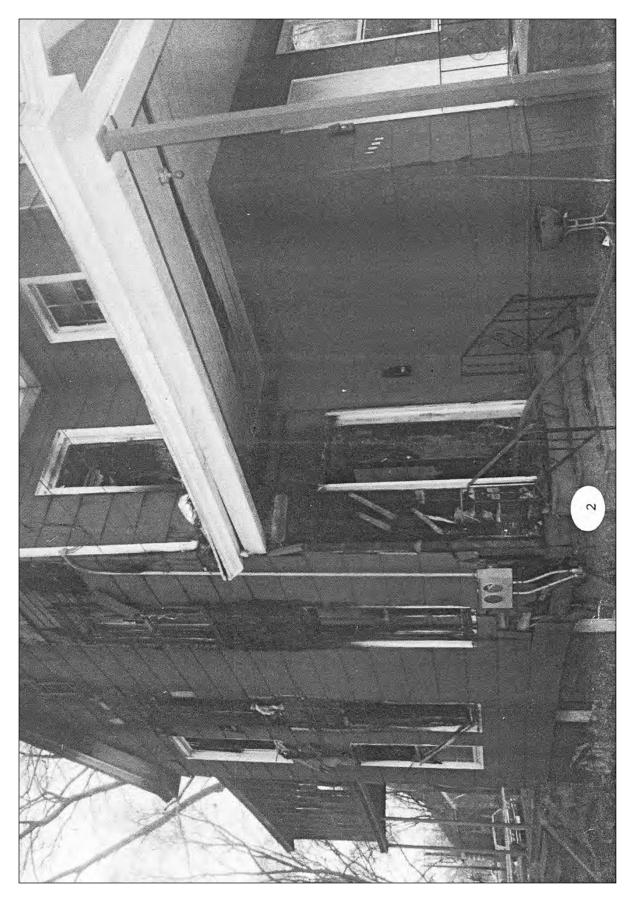
APPENDIX C

Photographs

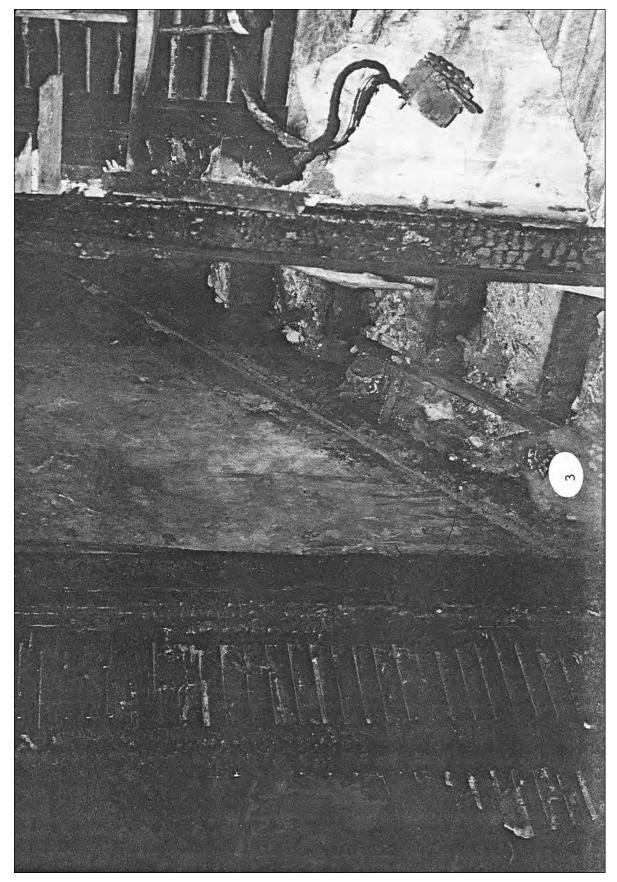
- 1. Front of house. Seven victims were found in the second floor room with two windows over porch at front. Survivors fled through windows onto porch roof.
- 2. Northwest corner of house.
- 3. Extensive damage in stairway going to second floor; door at bottom was open during fire. Escape downstairs was cut off.



1. Front of house. Seven victims were found in the second floor room with two windows over porch at front. Survivors fled through windows onto porch roof.



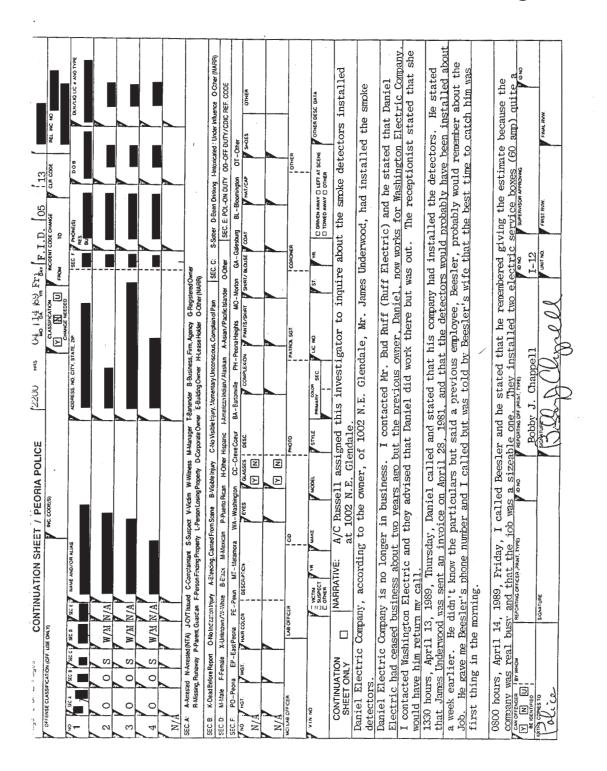
2. Northwest corner of house.



3. Extensive damage in stairway going to second floor; door at bottom was open during fire. Escape downstairs was cut off.

APPENDIX D

Fire Department Report Concerning Status of Smoke Detectors in Fire Building



Appendix D (Continued)